

WHAT IS CLAIMED IS:

- Sub A* → 1. A gravitational wave generating device comprising:  
a plurality of target nuclei aligned in a constrained  
state,  
a source of submicroscopic particles directed at the  
target nuclei,  
a computer-controlled logic system operatively  
10 connected to the particle source for selectively propelling  
the particles toward the target nuclei to produce a nuclear  
reaction, and  
a containment system for aligning the products of the  
nuclear reaction such that the particles move in approximately  
15 the same direction, produce a jerk or oscillation in the motion  
of the target nuclei and thereby generate gravitational waves,
2. A device according to claim 1 in which the plurality  
of target nuclei are contained in a superconducting medium.
3. A device according to claim 1 in which the plurality  
of target nuclei comprises a gas.
4. A device according to claim 3 wherein the gas includes  
25 electron gas.
5. A device according to claim 1 in which the plurality  
of target nuclei comprises a fluid.
- 30 6. A device according to claim 5 in which the fluid is a  
superconducting fluid.
7. A device according to claim 1 in which the plurality  
of target nuclei are contained in an electromagnetic field.

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5 8. A device according to claim 7 in which the  
electromagnetic field is external to the plurality of target  
nuclei.

9. A device according to claim 7 in which the  
electromagnetic field is ferromagnetic.

10 10. A device according to claim 7 in which the  
electromagnetic field is internal to the plurality of target  
nuclei.

15 11. A device according to claim 10 in which the  
electromagnetic field comprises intermolecular forces.

12. A device according to claim 1 in which the plurality  
of target nuclei are aligned in a spin-polarized state.

20 13. A device according to claim 1 in which the source of  
particles for producing nuclear-reaction products is a pulsed  
particle beam.

25 14. A device according to claim 13 in which the particles  
comprising the particle beam are photons.

30 15. A device for generating gravitational waves utilizing  
nuclear reactions to produce physical motion of submicroscopic  
particles.

35 16. A gravitational wave generating device comprising:  
a plurality of target energizable elements,  
a plurality of energizing elements that act on the  
energizable elements and generate gravitational waves, and

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5 a computer controlled logic system operatively  
connected to the energizing elements to control the action of  
the energizing elements.

10 17. A device according to claim 16 in which the energizable  
elements are energized to produce a third time derivative of the  
motion of the energizable elements or a jerk.

18. A device according to claim 16 in which the energizable  
elements are energized to produce a harmonic oscillation.

15 19. A device according to claim 16 in which the energizable  
elements are molecules.

20 20. A device according to claim 16 in which the energizable  
elements are atoms.

21. A device according to claim 16 in which the energizable  
elements are atomic nuclei.

25 22. A device according to claim 16 in which the energizable  
elements are nuclear particles.

23. A device according to claim 16 in which the energizing  
elements are an anisotropic particle beam.

30 24. A device according to claim 16 in which the energizing  
elements are an isotropic particle beam.

35 25. A device according to claim 16 in which the energizing  
elements create a multiquantum vibrational event for the  
energizable elements on a subpicosecond time scale and generate  
gravitational waves.

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26. A device according to claim 23 in which the beam  
particles collide with the energizable elements and produce a  
jerk or oscillation motion and generate gravitational waves.

27. A device according to claim 26 in which the beam  
particles collide with the energizable elements to produce a  
nuclear reaction.

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28. A device according to claim 16 in which the energizing  
elements are microwaves.

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29. A device according to claim 16 in which the energizing  
elements are one or more magnetic fields.

30. A device according to claim 16 in which the energizing  
elements are one or more electric fields.

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31. A device according to claim 16 in which the energizable  
elements are aligned.

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32. A device according to claim 16 in which the energizing  
elements move in step to define a gravitational-wave front and  
energize the energizable elements in sequential order to generate  
and accumulate gravitational-wave energy as the gravitational-  
wave front progresses.

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33. A device according to claim 16 in which the energizing  
elements are photons of a laser.

34. A device according to claim 16 in which the energizing  
elements are electrons.

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35. A device according to claim 16 in which the energizing elements are protons.

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36. A device according to claim 16 in which the energizing elements are neutrons.

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37. A device according to claim 16 in which the energizing elements are nuclear particles.

38. A device according to claim 16 in which the energizing elements are atomic nuclei.

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39. A device according to claim 16 in which the energizing elements are molecules.

40. A device according to claim 39 in which the molecules are ionized.

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41. A device according to claim 16, in which the energizing elements are current-carrying coils.

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42. A device according to claim 16, in which the energizable elements are one or more permanent magnets.

43. A device according to claim 16, in which the energizable elements are one or more electromagnets.

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44. A device according to claim 16, in which the energizing elements are current-carrying electrical conductors.

45. A device according to claim 16, in which the energizable elements are current-carrying electrical conductors.

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5 46. A gravitational wave detection device in which collector elements are interrogated in sequence according to an expected gravitational wave frequency in order to be a tuned gravitational wave receiver.

10 47. A device according to claim 46 in which the interrogations continue as the gravitational wave phase is determined and locked on by a control computer.

48. A device according to claim 46 in which the collector elements are transducers.

15 49. A device according to claim 48 in which the transducers are parametric transducers.

20 50. A device according to claim 46 in which the collector elements are capacitors.

51. A device according to claim 46 in which the collector elements are harmonic oscillators.

25 52. A device according to claim 46 in which the collector element's signal can be measured by a superconducting quantum interference device (SQUID).

30 53. A device according to claim 46 in which the signal from the collector elements are sensed using quantum non-demolition (QND) techniques.

35 54. A device according to claim 32 in which the gravitational waves comprising the wave front are coherent.

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5 55. A device according to claim 46 in which the collector elements are interrogated in a pattern according to an expected incoming gravitational wave direction in order to achieve directivity in GW reception.

10 56. A device according to claim 16 in which the energizable elements are energized in a pattern in order to achieve directivity in gravitational wave transmission.

15 57. A device according to claim 46 in which the directivity is changed over time in order to scan for gravitational wave transmissions.

20 58. A device according to claim 56 in which the directivity is changed over time in order to control the direction of the gravitational wave transmissions.

25 59. A device according to claim 56 in which the energizing elements are energized in a pattern that will transmit gravitational waves to a radiating gravitational wave transmitter in order to establish a GW communications source.

30 60. A device according to claim 16 in which the energizable elements are harmonic oscillators.

35 61. A device according to claim 46 in which the collector elements are an array of passive element sets or subsets.

62. A device according to claim 61 in which the collector element sets or subsets are disposed in a spherical array.

63. A device according to claim 62 in which the spherical array of collector element sets or subsets comprises a plurality

of piezoelectric crystals spread evenly over the surface of a sphere.

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64. A device according to claim 16 in which the energizable elements are capacitors.

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65. A device according to claim 16 in which the energizable elements are an array of passive element sets or subsets.

66. A device according to claim 65 in which the energizable element sets or subsets are disposed in a spherical array.

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67. A device according to claim 66 in which the spherical array comprises piezoelectric crystals spread evenly over the surface of a sphere.

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68. A device according to claim 66 in which the energizable element sets or subsets comprise spherical piezoelectric crystals.

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69. A device according to claim 68 in which electrodes are spread evenly over the surface of the piezoelectric crystals and operatively connected to a power source.

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70. A device according to claim 62 in which the collector element sets or subsets comprise spherical piezoelectric crystals.

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71. A device according to claim 70 in which electrodes are spread evenly over the surface of the piezoelectric crystals and operatively connected to a computer.



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72. A device according to claim 42 in which the permanent magnets are submicroscopic.

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73. A device according to claim 43 in which the electromagnets are submicroscopic.

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74. A device according to claim 46 in which the collector elements are submicroscopic.

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75. A device according to claim 46 in which the tuned gravitational wave receiver receives gravitational waves refracted by a medium positioned in front of the gravitational-wave receiver.

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76. A device according to claim 75 in which the medium is a superconducting medium.

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77. A device according to claim 75 including a lens for concentrating or focusing the gravitational waves.

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78. A device according to claim 75 including a series of gravitational-wave refracting media for concentrating or focusing the gravitational waves.

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79. A device according to claim 16 in which a refractive medium concentrates or focuses the gravitational waves emitted by the gravitational wave generator.

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80. A device according to claim 46 in which the gravitational wave frequency is generated by an extra terrestrial, astrophysical event.

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5 81. A device according to claim 56 in which the pattern produces constructive interference among some of the gravitational waves.

10 82. A device according to claim 56 in which the pattern produces destructive interference among some of the gravitational waves.

15 83. A device according to claim 16, in which the energizable elements are piezoelectric crystals.

20 84. A device according to claim 16, in which the energizable elements are nanomachines.

25 85. A device according to claim 84 in which the nanomachines are harmonic oscillators.

30 86. A device according to claim 84 in which the nanomachines are nanomotors.

35 87. A device according to claim 84 in which the nanomachines are solenoids.

88. A device according to claim 84 in which the nanomachines are microelectromechanical systems (MEMS).

89. A gravitational wave communications device comprising:  
30 a plurality of target nuclei aligned in a constrained state,

a source of submicroscopic particles directed at the target nuclei,

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5 a computer-controlled logic system operatively connected to the particle source for selectively propelling the particles toward the target nuclei to produce a nuclear reaction,

10 a containment system for aligning the products of the nuclear reaction such that the particles move in approximately the same direction, produce a jerk or oscillation in the motion of the target nuclei and thereby generate gravitational waves, and

a transmitter operatively connected to the containment system for modulating the gravitational waves.

15 90. A device according to claim 89 wherein the transmitter includes a modulator.

20 91. A device according to claim 90 in which the modulator imparts information to the gravitational waves.

25 92. A device according to claim 91 including an antenna connected to the modulator for directing the modulated gravitational waves to a remote location.

30 93. A device according to claim 92 including a detector at a remote location for receiving the modulated gravitational waves.

35 94. A device according to claim 93 including a demodulator connected to the detector.

95. A device according to claim 94 including a presentation device connected to the demodulator.

96 A gravitational wave communications device comprising:

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a gravitational wave generator for producing gravity waves,

5 a modulator connected to the generator for imparting information to the gravity waves,

a detector for receiving the modulated gravity waves, and

10 a demodulator for extracting the information from the gravitational waves and delivering it to a presentation device.

97. A device according to claim 16 in which the energizing elements are antiprotons.

15 98. A device according to claim 16 in which the energizable elements are antiprotons.

99. A gravitational wave propulsion system comprising:  
20 a gravitational wave generator for producing coherent gravitational waves,

a housing for the gravitational wave generator for channeling and directing the gravitational waves in a direction opposed to the direction of propulsion, and

25 refractive control elements for altering the direction of the gravitational waves.

100. A gravitational wave propulsion system comprising:  
a gravitational wave generator for producing coherent gravitational waves,

30 a housing for the gravitational wave generator for channeling and directing the gravitational waves in a direction opposed to the direction of propulsion, and

refractive control medial for focusing the gravitational waves.

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101. A gravitational wave focusing system comprising:  
a source of gravitational waves,  
5 a first medium for transmitting said gravitational waves, and  
a second medium interposed in the direction of travel  
of the gravitational waves for reducing the speed of transmission  
therein.

10 102. A device according to 101 in which the second medium  
is a superconductor.

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